

HINGE FOR A NOTEBOOK COMPUTER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention is related to a hinge for a notebook computer, and more particular to a hinge which can securely fasten a display on a body of the computer without a fastener when the computer is closed.

2. Description of Related Art

A conventional hinge used in a notebook computer only provides a function of positioning a display. The notebook computer generally must use a fastener or a lock member to attach the display on a body to prevent the display freely opening when the computer is closed.

Therefore, it is an objective of the invention to provide an improved hinge for a notebook computer to mitigate and/or obviate the aforementioned problem.

SUMMARY OF THE INVENTION

The main objective of the present invention is to provide a hinge for a notebook computer that can fasten a display on a body of the computer without a fastener when the computer is closed.

Other objects, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of a hinge in accordance with the invention;

FIG. 2a is a partial schematic view showing the movement of a tongue in opening;

FIG. 2b is a partial schematic view showing the movement of a tongue in closing;

FIG. 3 is an exploded perspective view of a pintle and flexible sleeves of the hinge in accordance with the invention;

FIG. 4a is a sectional view showing the pintle rotating in the sleeves in opening;

FIG. 4b is a sectional view showing the pintle rotating in the sleeves in closing;

FIG. 5 is an exploded perspective view of a second embodiment of the pintle and the flexible sleeves in accordance with the invention;

FIG. 6 is an exploded perspective view of a third embodiment of the pintle and the flexible sleeves in accordance with the invention;

FIG. 7 is a perspective view showing the hinge assembled in a notebook computer;

FIG. 8 is a perspective view showing the flexible sleeve with a helical slot for lubrication; and

FIG. 9 is a perspective view showing the flexible sleeve with a plurality of meshes for lubricating.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, a hinge (1) in accordance with the present invention comprises a base (10) assembled in a body of a notebook computer and a hinge member (14) provided in a display of the computer to pivotally mount it on the body of the computer. The configuration of the hinge (1) assembled in the notebook computer is shown in FIG. 7.

The base (10) has a barrel defining a passage (100) therein. A slot (not numbered) is defined in communication with the passage (100) and axially extended along the passage (100). A pulley bracket (11) is pivotally mounted on the base (10) by a screw (111). A spring (12) is provided on the base (10) with an end mounted on the pulley bracket (11). A pulley (110) is rotatably mounted on the bracket (11). Axes of the passage (100), the bracket (11) pivoting about the base (10) and the pulley (110) are all parallel to each other.

Referring to FIG. 3, a pintle (15) has a first section (150) received in the passage (100) of the base (10) and a second section (152) received in an opening (not numbered) of the hinge member (14) to engage the hinge member (14) with the base (10). A flange (not numbered) is formed between the first section (150) and the second section (152) to separate them. A plurality of lubrication grooves (154) are defined in an outer periphery of the first section (150) of the pintle (15).

At least one flexible sleeve (16) is provided in the passage (100). The first section (150) is rotatably received in the flexible sleeve (16). The flexible sleeve (16) has a cross-section substantially shaped as a question mark and includes a straight lower portion (18) and an upper portion shaped as an incomplete circle, whereby a gap is defined between a flat distal edge (17) of the upper portion and the lower portion (18). The passage (100) receives therein the upper portion of the flexible sleeve (16). The slot of the passage (100) receives therein the lower portion of the flexible sleeve (16) whereby the flexible sleeve (16) is prevented from rotating in the passage (100). Furthermore, the first section (150) has a first chamfer (151) axially formed along the outer periphery thereof and configured to matingly about the flat distal edge of the sleeve (16). A distance from the first chamfer (151) to a diametrically opposite point of the first section of the pintle (15) is substantially equal to a distance from an inner face of the flat distal edge to an opposite inner point of the upper portion of the sleeve (16), whereby, as shown in FIG. 4b, the pintle (15) is secured in a first position in the sleeve (16) when the computer is closed. However, a diameter of the first section of the pintle (15) is greater than the distance from the inner face of the flat distal edge (17) to the inner point of the upper portion whereby, as shown in FIG. 4a, an interference fit is defined between the pintle (15) and the sleeve (16) in a second position when the computer is open.

Referring back to FIG. 1, a tongue (13) is fixedly provided on the second section (152) of the pintle (15). A distal end of the tongue (13) is engaged with the pulley (110), as shown in FIG. 2b. The second section (152) also has a second chamfer (153) axially formed along an outer surface, as shown in FIG. 3. FIGS. 2a and 2b illustrate movement of the tongue (13) during opening and closing of the computer, respectively. When the computer is closed, the tongue (13) is located below the pulley (110), as shown by phantom lines in FIG. 2a. In this case, the tongue (13) is limited by the pulley (110) and the pintle (15) is unable to be rotated without an external force.

When the computer is to be opened, the hinge member (14) is pivoted upwards to rotate the pintle (15) and the tongue (13) counter-clockwise. Pushed by the tongue (13), the pulley (110) is rotated clockwise and the pulley bracket (11) is pivoted upwards. After being rotated over the pulley (110), the tongue (13) is disengaged from the pulley (110), and the pulley bracket (11) then is reversedly pivoted to return to the original position by the elastic force of the spring (12). When the computer is to be closed, the hinge